

# Contribution to the Knowledge of Phasmida I. The Changing Egg-size in *Extatosoma tiaratum* MacLeay

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## Introduction

*E. tiaratum* was originally an Australian stick-insect, but is now a commonly bred species in Britain.

From an Australian specimen, Korboot (1961) described the eggs. She found two sizes of them, a smaller and a bigger one. The smaller (width: 2.91 mm.) took nineteen months to hatch, while the larger ones (width: 3.21 mm.) hatched after only nine months. As the smaller only produced females, she thought that they were unfertilised. Handlington (1966) showed that parthenogenetic development of the eggs occurred in the species. Clark (1976) gives data for fertilised and unfertilised eggs of the British stock. He found the following dimensions for unfertilised eggs: width: 2.8-3.1 (mean 2.97) mm., and height: 3.5-4.2 (mean 3.74) mm.

As I earlier had noticed that eggs laid at the end of the egg-laying period seemed to be smaller than those laid at the beginning of the period, I measured all unfertilised eggs (240) laid by one female. I measured them with a micrometer and followed the same terminology as Clark (*l.c.*). Perhaps the female died too early. From four females the number of eggs varied from 185-456 (mean 285), and this female laid 242. But the life-span of the adults varies a lot, and maybe it was a natural death.

## Results

The sizes of the eggs are showed in Table I. Here an obvious diminution in the width is visible at the end of the oviposition period. In Table II the products of the width and the height are shown. Here one can see that the size of the eggs became bigger after c. 40 eggs, but after c. 170 eggs they became smaller and smaller.

## Discussion

The mean value of the width (3.32 mm.) of all eggs is similar to those of bigger eggs (3.21 mm.) described by Korboot (*l.c.*). But she suggested that those larger ones were fertilised, and mine were unfertilised. So therefore I do not think that the size of the eggs from British stock does correspond with the eggs from the Australian specimen. But we must bare in mind the fact that the animal used by Korboot was just brought in from nature, and the British stock has for several generations been bred in unnatural conditions indoors.

On the other hand, the figures by Clark (*l.c.*) are a bit different from mine. But since I made the measurements during a whole egg-laying period, the mean value perhaps is not so representative for one egg in the beginning or at the end of the period. But the ratio: width-height had the same value during the whole time, about 77-79%.

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Egg-number	Width			Height			Width/Height Ratio
	Min.	Max.	Mean	Min.	Max.	Mean	
1-20	3.17	3.44	3.32	4.19	4.43	4.22	79
21-40	3.22	3.48	3.36	4.23	4.38	4.32	78
41-60	3.02	3.56	3.38	4.18	4.45	4.36	78
61-80	3.22	3.48	3.40	4.27	4.55	4.40	77
81-100	3.25	3.50	3.40	4.17	4.44	4.32	79
101-120	3.32	3.56	3.46	4.26	4.50	4.40	79
121-140	3.15	3.54	3.40	4.20	4.45	4.32	79
141-160	3.13	3.50	3.40	4.16	4.49	4.34	78
161-180	3.12	3.50	3.31	4.08	4.48	4.32	77
181-200	3.11	3.56	3.32	4.05	4.49	4.31	77
201-220	3.05	3.38	3.23	4.06	4.49	4.22	77
221-240	2.65	3.20	2.99	3.65	4.05	3.86	77

TABLE I. The changing size of the eggs during the egg-laying-period.

Egg-number:	1-40	41-80	81-120	121-160	161-200	201-240
Mean-value:	14.4	14.8	14.9	14.8	14.2	12.6

TABLE II. The product of the width and height of the eggs.

As the eggs of phasmids vary in size generally, it might be an unobserved fact that they lay smaller ones at the end of the oviposition period.

### Conclusion

After c. 40 eggs were laid, the size increased and became constant, but after c. 170 eggs, they became smaller and smaller.

The following measurements were found in 240 unfertilised eggs:

width: 2.65-3.56 (mean 3.32) mm.  
 height: 3.65-4.55 (mean 4.28) mm.  
 product (width x height): 10.4-15.8 (mean 14.3) (mm.<sup>2</sup>)

### References

- Clark, J. T. 1976. The eggs of stick insect (Phasmida): a review with description of the eggs of eleven species. *Syst. Ent.*, 1: 95-105.
- Handlington, P. 1966. Parthenogenesis and diapause in the eggs of the Phasmid *Extatosoma tiaratum* (MacLeay). *J. Ent. Soc. Aust. (N.S.W.)*, 3: 59-65.
- Korboot, K. 1961. Observations on the life-histories of the stick insects *Acrophylla tessellata* Gray and *Extatosoma tiaratum* MacLeay. *Univ. Queensland Papers (Entomology)*, 1: 159-170.